

## SECTION 14

### COMPUTER PROGRAMS

#### 1.14.1 CONSULTANTS (DESIGN CALCULATIONS)

1. The use of computers as a tool in the performance of design computations and other applications such as determination of dimensions and grades is acceptable provided: (1) all computer work is under the direct supervision of an experienced structural engineer familiar with computer techniques, and (2) the consultant assumes responsibility for the logic and results of the program.
2. Documentation of all computer programs written by individual consulting engineering firms or obtained from other sources (including computer services) shall be submitted to the Manager, Bureau of Structural Engineering for approval before the programs are used. This submission shall include such information as would be required by an Engineer to determine what methods were used in the solution of the problem and what types of decisions were made by the computer.
3. The submission should include, as a minimum:
  - a. A description of the program, explaining exactly what the program does, what options are available, and what methods are used. Submission of a Flow Diagram is also recommended.
  - b. The input required by the program, including a description of each value, an input form (if one is used), and sample input.
  - c. The output given by the program, including a complete description of each value, any keys used in interpreting the output, and sample output from the given input.
  - d. Any constants or parameters used in the program.
  - e. An explanation of how the program was checked, including a copy of computations relative to test.
4. The approval only allows the consultant to include computer input and output in the design calculations. It does not relieve the consultant of the responsibility of ascertaining that the program is satisfactory for the use intended and performing properly. No further approval is required for any program unless modifications are made to the logic of the program.
5. When computer output is included in a set of computations for submission, a copy of the input forms necessary to interpret the data

should also be included.

6. Documentation of programs submitted to the Bureau of Structural Engineering will be safeguarded and will not be released for use by any other sources unless authorized by the author in writing.
7. Documentation for previously approved programs need not be submitted for each new project. However, the consultant shall include a letter indicating which version of each program was used in the project, together with the date of the prior approval.

#### **1.14.2 COMPUTER-AIDED DRAFTING (CONSULTANTS)**

1. Contract Plans prepared with the use of computer aided drafting systems will be acceptable provided that they are consistent with the provisions of this Manual. Guidance provided in the NJDOT CADD Standards Manual should be followed.
2. Samples of drawings produced by any particular system shall be submitted for review and general approval at the time of Proposal negotiations or prior to, but well in advance of, the Preliminary Plan Submission.
3. Changes required on drawings as a result of the Final design review must be made by the computer drafting system.
4. Changes required on drawings after award of the construction contract shall be made by the computer drafting system and shall conform to Subsection 1.39.1. If supplementary drawings are required, the type of drawing(s) to be furnished will be determined.
5. Samples of drawings for previously approved systems need not be submitted for each new project. However, the consultant shall submit a letter (with the Proposal) indicating which system will be used in the Project together with the date of the prior approval.